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## PATENT SPECIFICATION

665,177



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### COMPLETE SPECIFICATION

#### Shredding or Crushing Device

We, SOCIÉTÉ DE MATÉRIELS INDUSTRIELS ET AGRICOLES DE RÂPAGE G.U.I.R.A.P., a French body corporate, of 35, rue de la Bienfaisance, Paris 5 (Seine), France, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

10 This invention relates to shredding or crushing apparatus of the kind wherein blades or abrasive surfaces are carried on endless travelling chains, and has for its object the provision of improved apparatus.

15 The present invention consists in a shredding or crushing machine comprising a pair of chains arranged to have substantially horizontal material-engaging surfaces, each chain consisting of blocks formed by a series of longitudinally extending individual blades, said blocks of blades constituting the elements of the chain without any other intermediary, the blades being arranged in contiguous relationship, means for holding the blades of each block together, means to articulate said blocks with each other, and means for supporting and driving the chains.

20 According to another feature of the present invention, the blades are separated by interblades, with the object to allow the cutting edges of the blades to be imbricated.

25 The present invention also comprises the mounting of the blades on a spindle in such a manner as to render said blades removable, allowing not only easy replacement but also the changing of said blades in order to adapt their shape and length etc., to the particular work in view, and also to vary the hardness of the metal. Hereinafter is given an example 30 of application of the present invention.

In the attached drawings:—

35 Fig. 1 is a longitudinal vertical section of a shredding or crushing apparatus represented schematically.

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Fig. 2 is a transverse section of a 50 block of blades;

Fig. 3 is an end view of Fig. 2;

Fig. 4 shows the overlapping of a block of an upper surface with a block of a lower surface.

55 In the example chosen, the blades have been mounted in blocks 1, said blocks comprising blades 2 and interblades 3, said blades and interblades being saw toothed for example in a longitudinal 60 sense, as shown in Fig. 3.

A considerable number of sets of blocks, with variations in the toothing, the relative height and dimensions of the blades and interblades, the hardness of the 65 metal, etc., can be mounted in the same apparatus.

The blades are mounted on one or two spindles 4 and locked by bolts 5; said blades can be grooved at their sides.

70 In order to mount the blocks of teeth in chain, any known or suitable manner can be employed. The heads of the spindles can serve as the joints of the chain but it is preferable to employ special guide 75 spindles, said guide spindles placed either in the central part of said blocks of teeth or at the jointing of said blocks between themselves, as shown schematically in Fig. 1.

80 Guide spindles 6 can be guided in their horizontal course by the guides 7 and 8, said guide spindles being driven by the toothed spindles of drums 9, 10, 11, 12 of which said drums 9 and 10 embody for 85 example motors. There is thus obtained two endless shredding or crushing chains, the teeth of which function on the common horizontal zone of the course, either more or less in contact or 90 imbricated as shown in Figure 4.

85 It is unnecessary that the two shredding or crushing surfaces are parallel in the working zone, a certain angle between said surfaces may be employed 95 if desired, also curvilinear surfaces may be obtained by giving the appropriate form to the guides.

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The axes of drums 9, 10, 11, 12, can be provided adjustable to enable variation of the relative space between the blades; said axes may be resiliently mounted to ensure that the material engaging surfaces press resiliently on the material to be crushed under the action of the weight of the upper drums and of the upper chain. The upper drums being indicated at 10 9 and 11 (sprocket wheels carrying the chains there around).

The axes of drums 9 and 10 are staggered to aid the placing of the material to be treated between the shredding or crushing surfaces, the mounting of said axes enabling the freeing of a part of one of the two said surfaces. It is obvious that the upper part of the lower chain will offer a free surface at the 20 entering end so as to deliver the material of hopper 13 onto the lower chain surface in advance of the upper chain surface, the effect being equivalent to a much greater opening than in known 25 shredding or crushing apparatus.

Finally, by adding a shoe or similar device, not shown in the drawing, in proximity to the arrow 15, a pre-crushing similar to that obtained in known 30 apparatus, can be effected; the material thus more or less treated falling onto the lower working surface, where said material will be forced between the shredding or crushing surfaces proper. In 35 general, the speed of the two operating surfaces is relatively different, the lower surface being the fastest. If the apparatus functions as a fulling device, the speed of the two said surfaces is equal.

40 The scope of the present invention includes the reduction to zero or near to zero of the surfaces of the apparatus in employing two tangent drums, or drums provided with imbricated teeth, at the 45 periphery of said drums being mounted the blocks of blades according to the present invention, said drums turning at

equal or unequal speeds. One of the working surfaces of the apparatus can be reduced to zero the shredding or crushing being effected between a chain surface and a drum apparatus.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

1. A shredding or crushing machine comprising a pair of chains arranged to have substantially horizontal material-engaging surfaces, each chain consisting of blocks formed by a series of longitudinally extending individual blades, said blocks of blades constituting the elements of the chain without any other intermediary, 60 the blades being arranged in contiguous relationship, means for holding the blades of each block together, means to articulate said blocks with each other, and means for supporting and driving the 65 chains.

2. A machine according to Claim 1, wherein said blades are differently shaped and are substantially vertical to said material-engaging surfaces. 75

3. A machine according to Claim 1, wherein said blades are substantially vertical to said material-engaging surfaces and are provided at their outer ends with teeth. 80

4. A machine according to Claim 1, including means to adjust the spacing between said material-engaging surfaces.

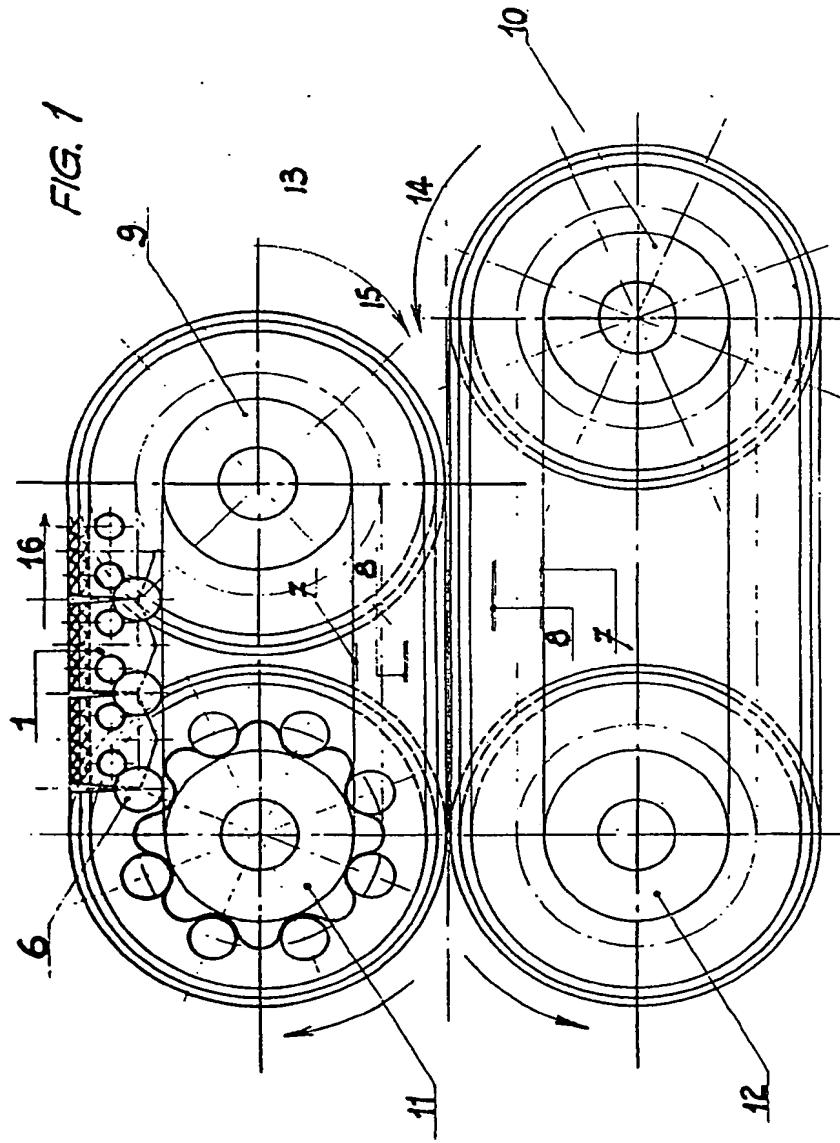
5. A machine according to Claim 1, wherein said blades are differently shaped and are toothed, the shapes of the blades of a block being such that the toothed end portions of the blades are imbricated. 85

6. A shredding or crushing machine substantially as described with reference to the accompanying drawings. 90

Dated this 17th day of May, 1949.  
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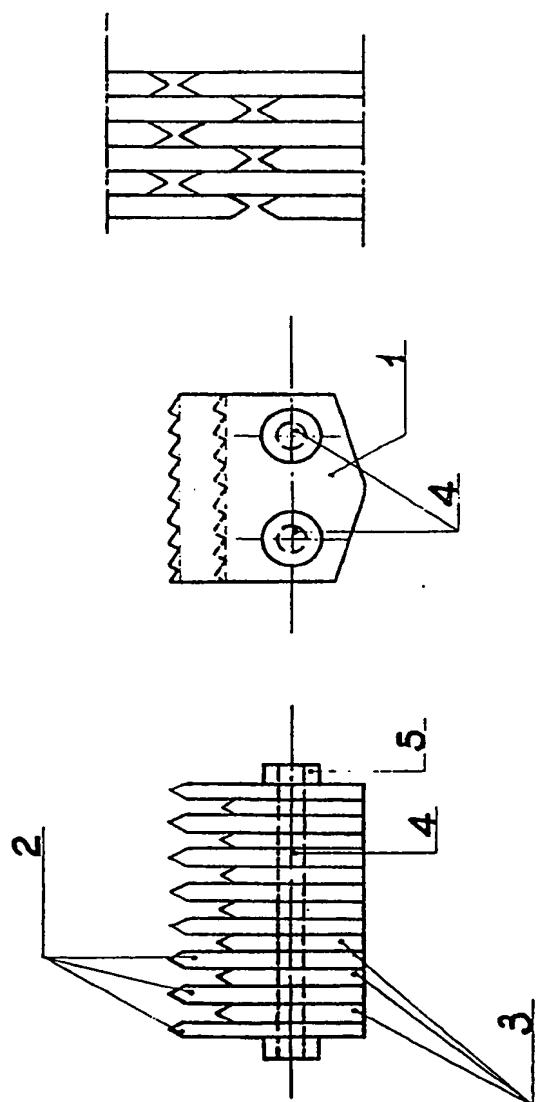
FIG. 1



SHEET 1

2 SHEETS  
SHEET 2

FIG 2 FIG 3 FIG 4



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Sheet 1

FIG. 1

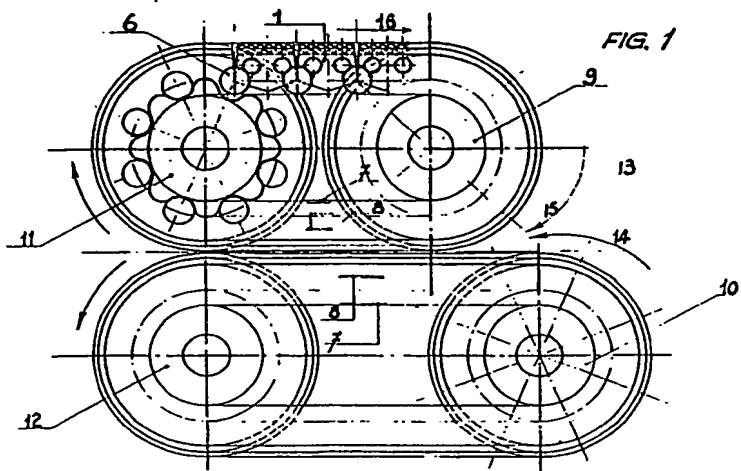


FIG. 2

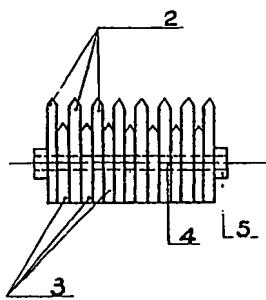


FIG. 3

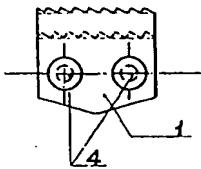
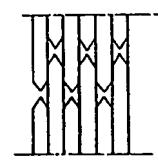


FIG. 4



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SHEET 2

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